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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,712	01/06/2004	Kevin K. Chan	FIS920030310US1	1711

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INTERNATIONAL BUSINESS MACHINES CORPORATION
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EXAMINER

JACKSON JR, JEROME

ART UNIT PAPER NUMBER

2815

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/707,712	Applicant(s) CHAN ET AL.	
	Examiner Jerome Jackson Jr.	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 16-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-10 and 12-15 is/are rejected.
- 7) ☒ Claim(s) 6, 7 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/6/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is no enablement for nitride over oxide where the nitride contacts sidewalls of the first and second layers. The figures and drawings are enabling for nitride over oxide where the oxide rather than the nitride contacts the sidewalls.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,2,5,8,9,13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato '032.

Sato shows in figure 15 a heterojunction bipolar transistor including an intrinsic base 201,202; a raised extrinsic base 203, 204,16 of polysilicon, polysige, and polysilicon, respectively; and an emitter is disposed in the self-aligned opening above the base. Claim 1 is anticipated. Claim 2 is rejected as there is a dielectric spacer 22. Claims 5,8 and 9 are rejected as there are different percentages of Ge in the extrinsic base layers. Claim 13 is rejected as there are metal contacts to the emitter, base, and collector regions as 14 or 15. Claim 15 is rejected as above noting that layers 201 (SiGe) and 202 (Si) comprise intrinsic base layers.

Claims 1,2,5,8,9,12,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Drews '553.

Drews teaches a heterojunction bipolar transistor including a collector 112, 113; an intrinsic base 117; a raised extrinsic base 118 and 119; and an emitter layer 124, wherein 118 is an etch stop which may comprise SiGe (col.6 line11) and 119 is a cover layer. Claim 2 is rejected as 121 is a dielectric spacer. Claims 5,8 and 9 are rejected as 118 is SiGe and 119 may be Si (col. 5 line 64-col.6 line 11). Claim 12 is rejected as portions of 118 and 119 are crystalline or polycrystalline depending on their location

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over the oxide or monocrystalline base region. Claim 13 is rejected as 128 is a metal contact.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drews or Sato, above, in view of Burghartz '059.

In regard to claims 13 and 14 Burghartz suggests a SALicide structure to form contacts to the emitter, base, and collector regions of Drews or Sato to enable lower capacitance and higher speed.

Claims 3,4, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato or Drews in view of Kondo '061.

Kondo teaches nitride on oxide sidewalls. It would have been obvious to practiced similar structure in Drews or Sato for self-alignment of the emitter region. Claims 3 and 4 are obvious structure.

Claims 1-5,8-10,13,15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kondo '061.

Kondo teaches a heterojunction bipolar transistor including a collector 11; intrinsic base 13, a "raised" extrinsic base 16 and 9; and an emitter 19 self-aligned to the extrinsic base. Claim 1 is anticipated. Claims 2-4 are rejected as the emitter 19 is spaced from the extrinsic base by dielectrics 17 and 18. Claims 5,8,9 are rejected as 16 is

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SiGe and 9 is polysilicon. Claim 10 is rejected as layer 9 is thicker than layer 16. Claim 13 is rejected as there are metal contacts 24-26. Claim 15 is rejected as the Ge concentration in the base is grade. See figures 7-17.


Claims 6,7,11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerome Jackson Jr. whose telephone number is 571 272 1730. The examiner can normally be reached on t-th 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571 272 1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jj



JEROME JACKSON
PRIMARY EXAMINER